

Claims:

2 What is claimed is:

1. An apparatus for providing a uniform web of filaments comprising:

4 a) filament transport means having an exit; and

b) a confined zone of reduced turbulence adjacent to said transport means exit, said
6 transport means exit directing the filament into said confined zone, said confined
zone for encouraging a uniform filament distribution in the cross direction as the
8 filaments pass through said zone.

2. An apparatus for providing a uniform web of filaments as in claim 1, wherein said
2 confined zone of reduced turbulence comprises a filament delivery slot, said delivery
slot defined by a slot member attached to said transport means exit, said slot member
4 having first and second opposing sideplates forming said filament delivery slot
therebetween, said transport means exit directing the filament into said delivery slot.

3. An apparatus for providing a uniform web of filaments as in claim 2, wherein said first
2 and second sideplates are substantially parallel to one another and to said transport
means.

4. An apparatus as in claim 2, wherein said delivery slot is further defined by a pair of
2 opposing endwalls attached at respective ends to said sideplates.

5. An apparatus as in claim 4, wherein said endwalls are substantially parallel to one
2 another and to said transport means.

6. An apparatus as in claim 1, further comprising a transition member between said
2 transport means exit and said confined zone, said transition member tapered from said
transport means exit to said confined zone.

7. An apparatus as in claim 1, further comprising electrostatic charging means in said
2 confined zone for electrostatically charging the filaments in said confined zone.

8. An apparatus as in claim 7, wherein said charging means comprise a plurality of
2 charging pins extending along substantially the length of said confined zone.

9. An apparatus as in claim 1, wherein said filament transport means comprise a plurality
2 of tubes.

10. An apparatus as in claim 9, wherein said plurality of tubes each having a diameter, and
2 said confined zone having a machine direction width less than said tube diameter.

11. An apparatus as in claim 1, further comprising means for pneumatically transporting
2 the filaments through said transport means and through said delivery slot.

12. An apparatus as in claim 1, further comprising a moving support member below said
2 confined zone for receiving said filaments.

13. An apparatus as in claim 12, further comprising bonding means for bonding said
2 filaments to one another after being deposited on said support member.

14. An apparatus for providing a uniform web of filaments comprising:

- 2 a) a plurality of filament transport tubes, each having an exit and a diameter;
- b) a transition member attached to said plurality of transport tube exits, said transition
4 member tapered from said transport tube exit;
- c) a slot member attached to said transition member, said slot member having first
6 and second opposing sideplates, said sideplates substantially parallel to and
separated from one another, a pair of opposing endwalls attached to the respective
8 ends of said sidewalls, a filament delivery slot thereby formed between said
respective sideplates and endwalls, said slot having a width defined by the distance
10 between said sideplates, said width smaller than said tube diameter, said tapered
transition member directing the filaments into said delivery slot, said first and
12 second plates and endwalls substantially parallel to said transport tubes so that the
filaments travel through said transport tubes and said delivery slot with minimal
14 machine direction deflection; and
- d) a plurality of charging pins on one of said first or second sideplates for
16 electrostatically charging the filaments as they pass through said delivery slot.

15. A process for providing a uniform web of thermoplastic filament, comprising the
2 sequential steps of:
a) transporting spun filaments through filament transport means into a confined zone
4 of reduced turbulence; and
b) transporting the filaments through said confined zone with minimal machine
6 direction deflection from said transport means, said filaments thereby being spread
and separated in said confined zone by forming a thin layer of the filaments along
8 the length of the confined zone.

16. A process for providing a uniform web of thermoplastic filaments as in claim 15,
2 wherein said confined zone comprises a filament delivery slot defined by a pair of
opposing sideplates and a pair of opposing endplates attached to the ends of said
4 sideplates.

17. A process for providing a uniform web of thermoplastic filaments as in claim 16,
2 wherein said sideplates are substantially parallel to and separated from one another,
said endplates substantially parallel to one another, and said first and second sideplates
4 and endwalls substantially parallel to said transport means.

18. A process as in claim 15, wherein said filament transport means comprise a plurality of
2 filament transport tubes.

19. A process as in claim 15, further comprising the step of transporting the filaments
2 through a tapered transition member between said transport means and said confined zone.

20. A process as in claim 15, further comprising the step of applying an electrostatic
2 charge to the filaments within said confined zone to further separate the filament.

21. A process as in claim 15, wherein said filaments are transported via pneumatic means.

22. A process as in claim 15, further comprising the step of depositing said filament layer
2 on a moving support below said confined zone.

23. A process as in claim 22, further comprising the step of bonding said deposited
2 filament layer.

24. A process for providing a uniform web of thermoplastic filaments, comprising the
2 sequential steps of:

a) pneumatically transporting spun filaments through a plurality of filament transport
4 tubes into a tapered transition member, said transport tubes having a diameter;

b) transporting said filaments through said tapered transition member into a delivery
6 slot, said delivery slot defined by a pair of opposing sideplates and a pair of opposing endplates attached to the ends of said sideplates, said sideplates

substantially parallel to one another, said endplates substantially parallel to one
2 another, said sideplates and said endplates substantially parallel to said transport
tubes, said delivery slot having a width defined by the distance between said
4 sideplates, said width narrower than said tube diameter;

c) transporting the filaments through said delivery slot with minimal machine
6 direction deflection from said transport tubes and transition member, said filaments
spread and separated in a cross direction in said delivery channel by forming a layer
8 of the filaments along the length of the elongated delivery slot; and

d) electrostatically charging the filaments within said delivery channel for further
10 separation and spreading.